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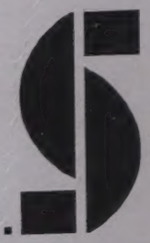

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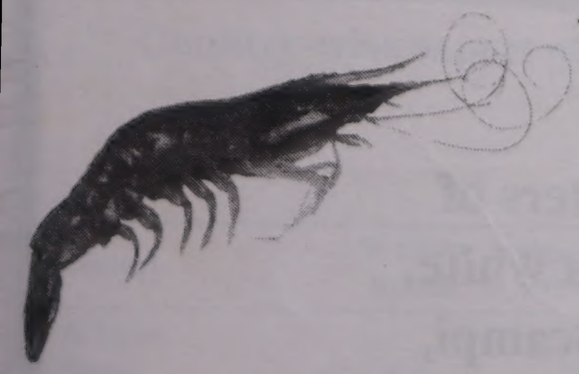

India's seafood export rises again

India's seafood export growth has exceeded again and the export figures of the April-January 2000-2001, period indicates 26.01% increase in dollar terms and 32.81% in rupee terms and 30.03% in quantity over the same period of last year.

The total export during the 10 month period at US$ 1194.68 million has already surpassed the US$ 1189 million exported during the whole of 1999-2000.

Japan continues to be the top buyer of Indian Seafood this year also. This accounts for 41.85%. This has grown from the 1906.25 of last year to 2264.79 this year. USA is the second largest buyer of Indian seafood. This accounts for 18.80%.

Frozen shrimp was the major item of our export basket during April January 2000-2001 also contributing to 71.60% in value terms of the total exports. Frozen finfish is the second major item of our export basket (12.23%).

In quantity terms Kochi port is on the top of the seafood export activities with its share of 22.22%. But in value terms Chennai port is on the top with its share of 28.30%.

Item-wise export of Marine Products

Q: Quantity in M. Tons
V: Value in Rs.Crores
$: US Dollar Million

Item	% Share to total		Apr-Jan 2000-2001	Apr-Jan 1999-2000	Variation	%
Frozen Shrimp	27.13	Q	94024	87461	6563	7.50
	71.60	V	3874.58	2943.17	931.41	31.65
	71.60	$	855.37	684.86	170.52	24.90
Frozen Finfish	46.61	Q	161535	101716	59819	58.81
	12.23	V	661.95	419.36	242.58	57.85
	12.23	$	146.13	97.58	48.55	49.75
Frozen Cuttlefish	8.39	Q	29086	28657	430	1.50
	4.59	V	248.38	249.91	-1.52	-0.61
	4.59	$	54.83	58.15	-3.32	-5.71
Frozen Squid	8.18	Q	28335	26233	2102	8.01
	4.69	V	253.93	224.16	29.77	13.28
	4.69	$	56.06	52.16	3.90	7.48
Dried items	1.36	Q	4716	3649	1067	29.24
	0.87	V	47.11	22.20	24.91	112.17
	0.87	$	10.40	5.17	5.23	101.16
Live items	0.44	Q	1526	1230	296	24.07
	0.61	V	33.09	29.25	3.84	13.12
	0.61	$	7.31	6.81	0.50	7.34
Chilled items	0.87	Q	3002	2396	606	25.28
	1.03	V	55.63	31.34	24.30	77.54
	1.03	$	12.28	7.29	4.99	68.45
Others	7.02	Q	24316	15159	9158	60.41
	4.38	V	236.88	155.13	81.75	52.70
	4.38	$	52.29	36.10	16.20	44.88
Total	**100.00**	**Q**	**346541**	**266501**	**80040**	**30.08**
	100.00	**V**	**5411.56**	**4074.53**	**1337.03**	**32.81**
	100.00	**$**	**1194.68**	**948.12**	**246.57**	**26.01**

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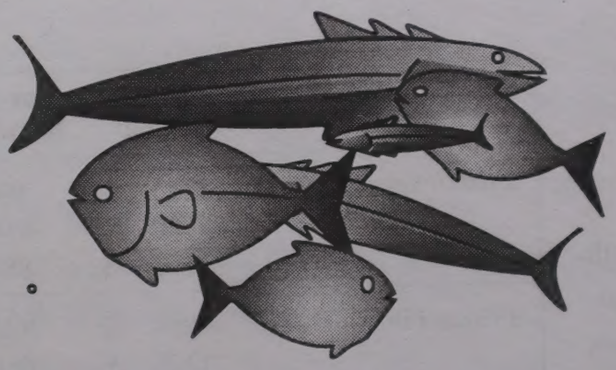

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Country-wise export of Marine Products

Q: Quantity in M. Tons
V: Value in Rs.Crores
$: US Dollar Million

Country	% Share to total		Apr-Jan 2000-2001	Apr-Jan 1999-2000	Variation	%
A Japan						
Japan	16.76	Q	58064	54603	3462	6.34
	41.85	V	2264.79	1906.25	358.54	18.81
	41.85	$	499.99	443.57	56.42	12.72
B USA						
USA	10.07	Q	34905	28359	6545	23.08
	18.80	V	1017.64	584.59	433.05	74.08
	18.81	$	224.66	136.03	88.63	65.15
C European Union						
UK	2.48	Q	8588	7706	882	11.45
	4.37	V	236.68	172.71	63.97	37.04
	4.37	$	52.25	40.19	12.06	30.01
Spain	4.04	Q	13993	14897	-904	-6.07
	2.61	V	141.29	146.42	-5.14	-3.51
	2.61	$	31.19	34.07	-2.88	-8.45
Belgium	1.31	Q	4532	4053	480	11.84
	2.06	V	111.40	95.36	16.04	16.82
	2.06	$	24.59	22.19	2.40	10.82
Italy	2.14	Q	7401	7191	210	2.91
	1.49	V	80.50	73.88	6.62	8.96
	1.49	$	17.77	17.19	0.58	3.37
France	1.23	Q	4246	3436	810	23.59
	1.10	V	59.32	44.25	15.06	34.04
	1.10	$	13.09	10.30	2.79	27.09
Netherlands	1.05	Q	3631	4311	-680	-15.78
	0.95	V	51.42	57.58	-6.15	-10.69
	0.95	$	11.35	13.40	-2.05	-15.30
Germany	0.37	Q	1299	1876	-577	-30.77
	0.68	V	36.95	39.96	-3.01	-7.52
	0.68	$	8.16	9.30	-1.14	-12.26
Greece	1.28	Q	4433	3075	1358	44.17
	0.66	V	35.98	25.92	10.06	38.83
	0.66	$	7.94	6.03	1.91	31.67
Portugal	1.04	Q	3596	3422	175	5.10
	0.62	V	33.82	29.42	4.40	14.95
	0.63	$	7.47	6.85	0.62	9.05
Denmark	0.07	Q	249	170	79	46.57
	0.08	V	4.09	2.76	1.33	48.05
	0.08	$	0.90	0.64	0.26	40.63

Sagarkpripa

The 15.5m Fuel efficient steel fishing vessel developed at CIFT

Mechanisatlon introduced in the late 50's and early 60's has given a quantum jump to the fishing industry of the country. The designs for the mechanised boats were initially introduced by GIFT in collaboration with FAG. These designs were introduced at a time when the fuel prices were affordable and the resources plenty and near. As time went by, increased fishing pressures near the shore depleted the fish resources in the inshore waters, which forced the operators of mechanised vessels to move out into deeper waters. Injudicious increase of the fishing fleet in the 70's and 80's also forced the owners to reach the fishing ground and back to the harbour earlier than others to net fairly good profit. These factors made the operators to increase the size of the vessel and power of the engine. But, due to the complexities of hydrodynamics associated with marine craft, much needed speed and pull characteristics of the vessels were not improved as expected with respect to the increase in power. It is estimated that 70% of the cost of operation of the mechanised fishing vessels account for fuel cost alone. Ever increasing fuel prices coupled with increasing power requirements of these vessels are fast pushing the once lucrative mechanised fishing into an unattractive business venture.

Under these circumstances, CIFT started to search for ways to reduce the fuel requirements of medium class fishing vessels to

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Country	% Share to total		Apr-Jan 2000-2001	Apr-Jan 1999-2000	Variation	%
Switzerland	0.06	Q	216	326	-109	-33.61
	0.06	V	3.44	3.53	-0.09	-2.53
	0.06	$	0.76	0.82	-0.06	-7.32
Austria	0.01	Q	47	34	14	41.40
	0.02	V	1.06	0.27	0.79	290.79
	0.02	$	0.24	0.06	0.18	300.00
Ireland	0.01	Q	17	40	-23	-56.78
	0.01	V	0.46	0.82	-0.36	-43.63
	0.01	$	0.10	0.19	-0.09	-47.37
Sweden	0.00	Q	17	78	-61	-78.11
	0.01	V	0.33	1.53	-1.21	-78.65
	0.01	$	0.07	0.36	-0.29	-80.56
Finland	0.00	Q	0	0	0	...
	0.00	V	0.00	0.00	0.00	...
	0.00	$	0.00	0.00	0.00	...
Norway/OSL	0.00	Q	1	34	-34	-98.33
	0.00	V	0.01	0.58	-0.57	-98.70
	0.00	$	0.00	0.13	-0.13	-100.00
	15.08	Q	52267	50647	1620	3.20
	14.72	V	796.76	695.01	101.75	14.64
	14.72	$	175.90	161.72	14.17	8.76
D China						
China	36.48	Q	126405	71785	54620	76.09
	9.08	V	491.31	301.77	189.54	62.81
	9..08	$	108.46	70.22	38.24	54.46
Hong Kong	4.28	Q	14848	14401	447	3.10
	2.68	V	145.05	136.36	8.69	6.37
	2.68	$	32.02	31.73	0.29	0.91
	40.76	Q	141253	86186	55067	63.89
	11.76	V	636.36	438.13	198.23	45.24
	11.76	$	140.49	101.95	38.54	37.80
E South East Asia	9.13	Q	31626	26186	5440	20.77
	7.07	V	382.61	260.85	121.76	46.68
	7.07	$	84.47	60.70	23.77	39.16
F Middle East	3.39	Q	11739	8976	2763	30.78
	2.56	V	138.61	81.28	57.33	70.53
	2.56	$	30.60	18.91	11.69	61.82
G Others	4.82	Q	16686	11543	5143	44.55
	3.23	V	174.79	108.42	66.37	61.21
	3.23	$	38.59	25.23	13.36	52.95
Grand Total	**100.00**	**Q**	**346541**	**266501**	**80040**	**30.03**
	100.00	**V**	**5411.56**	**4074.53**	**1337.03**	**32.81**
	100.00	**$**	**1194.68**	**948.12**	**246.57**	**26.01**

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improve their profitability. The ensued studies revealed that the hydrodynamic efficiencies of the existing propellers were only about 30-35%. An Institute research team set about to improve the efficiencies of these propellers. The improved designs when fixed on existing fishing vessels resulted about 10-15% fuel saving. The hydrodynamic aspects of existing hulls limited further improvements of these propellers. Modifications of the existing hulls were impractical and therefore the research team concentrated on improving the existing hull design to evolve a more hydrodynamically efficient one. Computer simulations were extensively used at the Computer Aided Design Centre of the Institute for this. Finally the research team came up with an efficient hull design with matching propeller system with an estimated fuel saving of not less than 20% taking into account all the operational parameters of medium class mechanised fishing vessels.

The developed design/technology had to be evolved into a practical product to test its capabilities and for its adoption by the end users. Apart from the survival of the fishing industry, it is of national interest too, as almost 50% of the fuel being used in the shipping industry in the country is accounted by the fishing fleet of the country, ICAR was quick to understand the potential of the research and sanctioned the proposal to build a prototype of the new design under the agricultural cess-fund research theme of ICAR.

The Sagarkripa was thus evolved out of about 22 tonnes of steel to ply over the exclusive economic zone of

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Port-wise export of Marine Products

Q: Quantity in M. Tons V: Value in Rs.Crores $: US Dollar Million

Ports	% Share to total		Apr-Jan 2000-2001	Apr-Jan 1999-2000	Variation	%
Kandla	10.12	Q	35080	30900	4180	13.53
	4.02	V	217.75	176.79	40.96	23.17
	4.02	$	48.07	41.14	6.93	16.84
Porbandar	6.31	Q	21873	27458	-5586	-20.34
	1.60	V	86.41	133.40	-46.99	-35.22
	1.60	$	19.08	31.04	-11.96	-38.53
Mumbai	3.31	Q	11482	14271	-2789	-19.55
	2.67	V	144.38	126.44	17.94	14.19
	2.67	$	31.87	29.42	2.45	8.33
J N P	18.93	Q	65592	41418	24174	58.37
	8.97	V	485.38	320.34	165.04	51.52
	8.97	$	107.15	74.54	32.61	43.75
Goa	2.38	Q	8248	8317	-70	-0.84
	0.45	V	24.33	32.31	-7.98	-24.70
	0.45	$	5.37	7.52	-2.15	-28.59
Mangalore	0.96	Q	3328	0	3328	0.00
	0.30	V	16.22	0.00	16.22	0.00
	0.30	$	3.58	0.00	3.58	0.00
Karwar	0.33	Q	1149	0	1149	0.00
	0.07	V	3.73	0.00	3.73	0.00
	0.07	$	0.82	0.00	0.82	0.00
Kochi	22.22	Q	77009	73568	3441	4.68
	15.73	V	851.33	859.76	-8.42	-0.98
	15.73	$	187.94	200.06	-12.11	-6.05
Trivandrum	0.11	Q	372	539	-167	-30.99
	0.19	V	10.03	8.47	1.56	18.36
	0.19	$	2.21	1.97	0.24	12.18
Tuticorin	4.37	Q	15142	14490	652	4.50
	7.98	V	432.05	326.98	105.07	32.13
	7.98	$	95.38	76.09	19.29	25.35
Chennai	8.79	Q	30463	21228	9234	43.50
	28.30	V	1531.24	862.23	669.02	77.59
	28.30	$	338.05	200.63	137.41	68.49
Vizag	5.82	Q	20161	20110	51	0.25
	16.11	V	871.90	781.20	90.70	11.61
	16.11	$	192.49	181.78	10.71	5.89
Paradeep	0.00	Q	0	0	0	0.00
	0.00	V	0.01	0.00	0.00	0.00
	0.00	$	0.00	0.00	0.00	0.00
Calcutta	4.80	Q	16650	13902	2748	19.77
	10.23	V	553.49	445.35	108.14	24.28
	10.23	$	122.19	103.63	18.56	17.91
Pipavav	11.54	Q	39993	300	39693	***.**
	3.39	V	183.30	1.26	182.04	***.**
	3.39	$	40.47	0.29	40.17	***.**
Total	100.00	Q	346541	266501	80040	30.03
	100.00	V	5411.56	4074.53	1337.03	32.81
	100.00	$	1194.68	948.12	246.57	26.01

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the country. The vessel was dedicated to the fishing industry on 17th September 1999, by Dr. Anwar Alam, Deputy Director General (Engg), ICAR at a function held at Central Institute of Fisheries Technology and the vessel was launched on 26th September 1999.

Unlike usual fishing vessel's blunt shape, the Scientists gave a narrow forward shape to the vessel peculiar of fast marine craft. This would have made the motion characteristics of the vessel worse for fishing operations. But, the Scientists succeeded in improving the motion characteristics of the vessel beyond existing designs to offset this problem. Improvements in aft shapes helped the vessel to achieve better stability for operation in more rough and deeper waters. This aft shape, which is unconventional to fishing vessels, creates a higher pressure zone and twisting of flow streamlines to achieve improved hydrodynamic efficiency for the hull. The vessel is also fitted with an asymmetric nozzle propeller system, the aerofoil sections of which were developed at CIFT to generate hydrodynamically optimum thrust factors in complex how conditions peculiar to small and medium marine craft.

While the main aim of the Institute was to come up with a fuel-efficient fishing vessel design, the research team also ensured that the design of the vessel is conducive for better production. Thus, apart from better fuel efficiency and motion characteristics, the vessel also boasts of ergonomic design factors for better operation and easy maintenance of the vessel, better accommodation standards, large and well-insulated fish holds, and improved fish deck arrangements.

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HACCP's future rests with the new administration

As 2000 came to a close, the Food and Drug Administration reported that the seafood industry was making substantial progress in implementing its Hazard Analysis Critical Control Point (HACCP) program. More U.S seafood processors were doing well, and over half had succeeded in all HACCP elements.

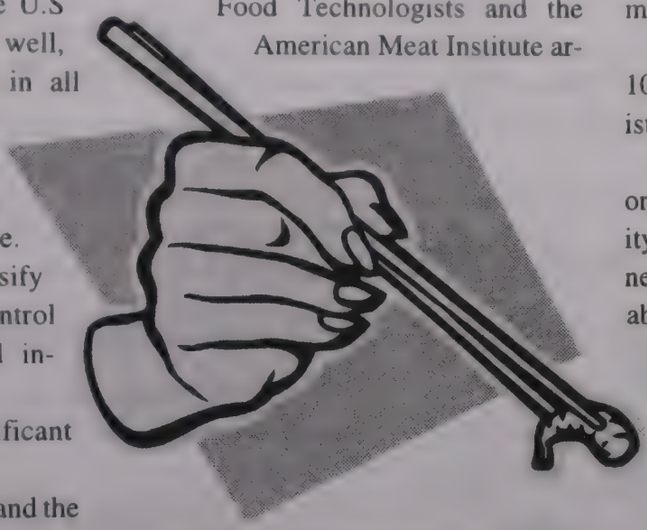
Nonetheless, FDA noted that some plants are lagging behind with HACCP compliance. In response, FDA plans to intensify training and inspections to control pathogens and histamines and increase import surveillance.

However, a much more significant change looms on the horizon.

An incoming administration and the disparate HACCP systems being implemented at FDA and the U.S. Department of Agriculture for Seafood, meat and poultry may lead to a serious political push this year for a single food-safety agency. A warning shot was fired last fall when a consumer organization told Congress, "...seafood HACCP [is] an industry honor system of dubious value and unworthy of public support... Consumers can be much more confident in the meat and poultry HACCP system, because the industry has complied with the regulation and the government is monitoring its effectiveness using performance standards."

Retailers also have concerns. The Food Marketing institute has concluded, "... new challenges have arisen that... threaten to overwhelm the ability of our current regulatory system to respond effectively. We, believe that designating a single agency responsible for the safety of our food is essential..."

Others, like the National Cattleman's Beef Association, American Society for Microbiology, Institute for Food Technologists and the American Meat Institute ar-



gue that HACCP should free up USDA personnel to inspect the thousands of food plants under FDA's jurisdiction that are being inspected less frequently than those processing meat and poultry.

And the National Academy of Sciences (NAS) has concluded, "Officials ... operate within an institutional framework that is out of date and poorly designed to accomplish the critical goals that regulation in this field must achieve. The increasing complexity of food production and delivery and the exploding internationalization of the U.S. food supply impose added pressure on the federal regulatory apparatus, which was constructed in simpler times."

Worried that a "turf" battle among agencies and congressional committees would be disruptive, the Clinton administration rejected advice to set up a new agency. Instead, it directed FDA and USDA to "coordinate" their way around the problems noted by NAS. However, bipartisan bills were filed in the House and Senate last Congress to create an independent food Safety administration.

These bills went nowhere in the 106th Congress because of the administration's opposition.

Incoming administrations often reorganize to put their "stamp" of authority on agency bureaucrats. What the new Bush appointees will have to say about HACCP remains to be seen.

Their answers will shape the seafood-safety debates of the 107th Congress and the future direction of HACCP for our industry.

Courtesy: NFI

HACCP has increased seafood safety, says FDA's first published report card

Eighty percent of processors have adopted key parts of the mandatory program

Seafood processors are producing safer seafood under the Hazard Analysis Critical Control Point (HACCP) program, says the Food and Drug Administration in its first report card on HACCP compliance, issued in December.

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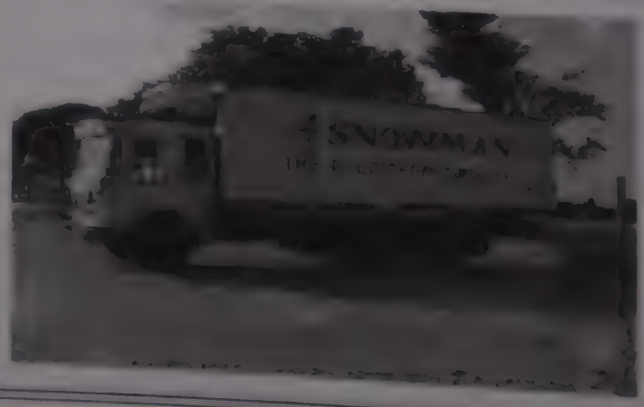

to adopt the science-based HACCP program three years ago to prevent contamination at critical points in the seafood processing chain.

The FDA evaluation reviewed 1999 data from about 3,600 U.S. seafood processors handling more than 350 species of fish. In its report, the FDA made a distinction between overall HACCP compliance and compliance with important elements of the plan.

The agency found that 80 percent of companies with HACCP plans had successfully adopted key elements of HACCP in 1999, up from 74 percent in 1998.

Also, 54 percent of companies with HACCP plans had successfully implemented the whole program, compared to 47 percent of firms inspected in 1998.

"We're making very good, continued and sustained progress to that 100 percent," says Donald Kraemer, associate director with the FDA's office of seafood.

But the FDA is focusing on the 22 percent of seafood firms that don't have the required HACCP plans.

"There's no excuse for that. We're three years out now," says Kraemer.

The FDA evaluation was timed so that it could be included in a General Accounting Office investigation into seafood safety. Consumer advocates recently questioned the adequacy of the seafood-inspection system.

The report does not measure the effectiveness of HACCP in preventing outbreaks of food borne illness. It simply gauges the industry's compliance with HACCP. There are too many problems with outbreak data to use it as a yardstick, says Kraemer.

The National Fisheries Institute's science and technology committee plans to meet with FDA officials to discuss the report.

Fatty fish cuts risk of death from heart attack in elderly

Older individuals are less likely to die from a heart attack if they eat at least one serving of fatty fish per week, according to a study presented at the American Heart Association's 41st Annual Conference on Cardiovascular Disease Epidemiology and Prevention.

Eating fatty fish at least once per week was associated with a 44 percent lower risk of dying from a heart attack among a group of older adults, average age 72. In contrast, eating fried fish – which is typically lean – was not associated with a lower risk of dying from a heart attack. Examples of fatty fish are tuna, salmon and mackerel; examples of lean fish are cod, catfish and snapper.

"Our findings are consistent with results of prior studies done in predominantly middle-aged adults," says Dariush Mozaffarian, M.D., lead author of the study and fellow in cardiology and health services research at the University of Washington/Seattle Veterans Affairs Medical Center. Fish is thought to protect against death from heart attack because it contains good fats called omega-3 (or n-3) polyunsaturated fatty acids (PUFAs). "Fatty fish are more abundant in omega-3 fatty acids, while fried fish are typically lean fish without significant omega-3 fatty acids. Because these omega-3 fatty acids may protect against dying from a heart attack, eating fatty fish may be of greater benefit than eating fried fish," says Mozaffarian.

The researchers found that individuals with a higher intake of fatty fish had higher plasma levels of omega-3 PUFAs. There was no correlation between intake of fried fish and plasma levels of omega-3 PUFAs. Many deaths from heart disease are due to cardiac arrhythmias, or heart rhythm disturbances, and omega-3 fatty acids may reduce the risk of arrhythmias, he says. "The study suggests that modest consumption of fatty fish at any age may be beneficial," says David S. Siscovick, M.D., professor of medicine and epidemiology, and co-director of the University of Washington Cardiovascular Health Research Unit, and a co-author of the study. "When encouraging people to eat a healthy diet, it may be important to differentiate which types of fish are good sources of omega-3 fatty acids," he says.

Researchers analyzed the relationship between eating fatty fish, eating fried fish and the risk of fatal heart attack and coronary heart disease deaths among nearly 4,000 men and women older than age 65 involved in the National Heart, Lung and Blood Institute's Cardiovascular Health Study, launched in 1988 to assess the determinants of heart disease and strokes among older adults. At the beginning of the study, all participants were free of known cardiovascular disease. Mozaffarian and his colleagues used a detailed food questionnaire to assess the participants' usual diet. Participants were followed for an average of 6.8 years.

"The study highlights the benefit of one or two servings per week of fish rich in omega-3-PUFAs, not all fish," says Siscovick. In October 2000, the American Heart Association issued updated dietary guidelines for healthy adults, which recommend eating at least two servings of fatty fish per week. For more information on the 2000 dietary guidelines visit.
http://www.americanheart.org/org.

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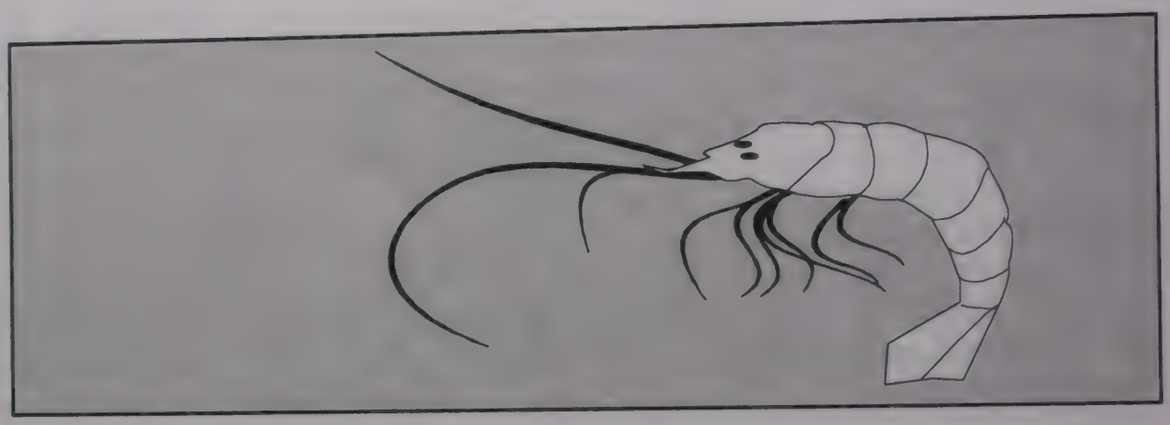

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Process and Production Methods (PPMs) -Implications for Developing Countries

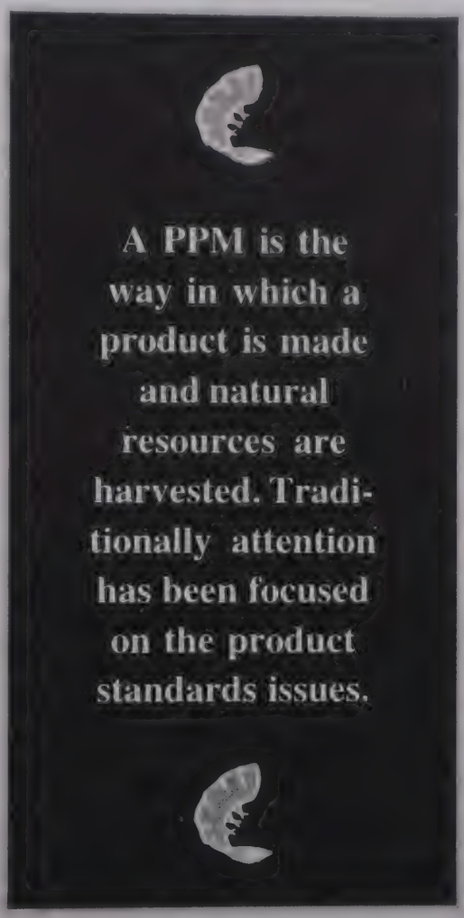
Sandeep K. Tetarwal and Pradeep S. Mehta

In the context of trade and environment relationship, process and production methods (PPMs) have become one of the most debated sets of words in trade law history. The relationship has been made complex since the first Tuna-Dolphin panel declared that production method based distinctions were not allowed under the GATT The panel held that a country cannot discriminate against imports on the basis of the way in which they are produced.

A PPM is the way in which a product is made and natural resources are harvested. Traditionally attention has been focused on the product standards issues, but now PPM standards are being addressed increasingly. From the environmental viewpoint both product standards as well as PPM standards are important because many a times environmental problems are associated with the production process than with the product itself.

PPMs as non-tariff trade barriers: However, many developing countries are worried about possibility of PPMs, becoming non-tariff trade barriers. Exporters of developing countries are apprehensive that their products may be denied access or they may have to incur high adjustment costs in order to maintain access to overseas markets. Allowing PPM based trade practices would give many countries greater opportunity to protect their industries unfairly against foreign competition. Under the pretext of environmental concerns some countries might penalise other countries which do not import certain goods from their domestic industry by enacting new regulations.

In this regard the US shrimp-turtle case is of great significance for internationally traded products, which like shrimp, might be subject to environmental standards. The WTO Appellate Body report in the case represents a significant advance in the WTO's examination of the interaction between WTO trade rules and domestic trade measures taken on environmental grounds.


A PPM is the way in which a product is made and natural resources are harvested. Traditionally attention has been focused on the product standards issues.

Imposing environmental standards on other nations: Some countries could also take unilateral actions motivated mainly by economic considerations. Also there are concerns that one or several nations could use their superior commercial power to impose their environmental standards on other nations without their consent or participation in the development of such standards.

Similarly the argument of value based PPMs is also controversial, in which PPMs that conflict with strong values or moral preferences are targeted. In these cases frictions are bound to arise when PPM requirements are derived from values that may not be universally accepted. Powerful countries will be able to indulge their "values" but weaker ones are less likely to be able to do so.

This is not to say that environmental concerns are not important but environmentally based PPM measures can become helpful only if they are used as a means to set higher standards and are supplemented with financial and technical assistance to developing countries. However using PPM measures, as trade barriers could never become an effective or appropriate move in dealing with environmental problems.

Pros and cons of PPMs as a trade issue: In fact most of the environmental problems are intrinsically local and their effects do not get transferred to importing countries through products. Hence there is little justification for applying PPMs standards to imported products.

Sustainable development is a larger issue which incorporates efficient allocation of world's resources, actions to protect environment, creation of additional wealth for environmental protection in developing countries, poverty alleviation, and so on. Relationship between trade and sustainable development largely depends on environmental and macro-economical policies.

Environmental policies are enacted to ensure that economic actors comply with international, regional or national environmental standards. In this re-

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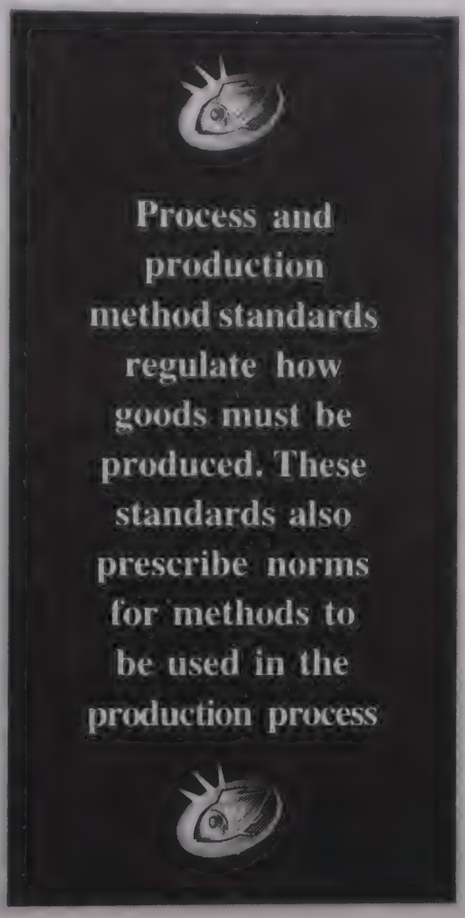
gard, process and production method (PPM) based measures have been suggested as a possible tool to promote environmental sustainability. However, in many cases PPMs based environmental standards are used to create trade barriers and developing countries are denied market access.

There are many types of environmental standards at the different stages of life cycle of products. These standards include:

* Ambient standards, which set allowable pollution levels for air, water and soil;
* Emission standards, which set maximum levels of pollution to be discharged;
* Product standards that specify the physical and chemical properties of a product, and;
* Process and production method standards that prescribe which production processes and technologies are allowed.

The two important standards relevant are product standards, and process and production method (PPM) standards. Product standards specify the environmental characteristics of the product that are deemed necessary to avoid environmental harm from the use or disposal of products. These standards include packaging rules, sanitary requirements, energy efficiency, vehicle exhaust emission standards and recyclability etc.

Process and production method standards regulate how goods must be produced. These standards also prescribe norms for methods to be used in the production process based on what kinds of impact it may have on the environment. Standards based on process and production methods assume significance in international trade that they completely lack at the domestic level. Each country can set its own standards for acceptable levels of emission and pollution during the production of goods. Applied to trade goods, they amount to the regulating country setting standards on economic activities in the country of production. Process standards often spell out health, safety and cleanliness standards to be adopted during manufacturing of a product.


Process and production method standards regulate how goods must be produced. These standards also prescribe norms for methods to be used in the production process

Product and non-product related PPMs

The distinction between product related PPMs and non-product related PPMs is important, since these two are given entirely different treatment under international trade law. The distinction between the two is based on PPM's affects on the characteristics of final product.

In non product related PPMs, different environmental impact is caused by the way a product is produced and not by the product itself. Take for example, two copies of a book. One is printed on recycled paper and the other on virgin paper. As explained above these two involve different PPMs. But the important factor is that, whether the final print of book has different qualities that may cause it to be treated differently in its use, handling or disposal. If the utility of book printed on recycled paper is same as that of the book on virgin paper and there is no difference in handling and disposal, then the process is a non-product related PPM. It has a negligible impact on the final product. Also in these type of cases one should accept the methodology of measuring environmental impacts during the full life cycle of a product, For example recycled newspaper uses a lot of energy and could be worse than virgin fibre.

The way a product is produced affects its final characteristics and can cause harm to environment and human health in the importing country. These PPMs where, environmental damage is caused by the product itself or by its physical constituents are known as 'product related PPMs'.

PPMs and international trading rules

According to GATT's most favoured nation (MFN) status, trade must be conducted on the basis of nondiscrimination between countries. "Like products" must be taxed the same way and placed under similar entry conditions. The GATT used the concept of "Like products" to create an identity between imported and locally produced goods. The usual context in which environmental laws came to be questioned were GATT Articles 1, III, XI and XX.

* Article I, which codifies MFN principle, internal states that "any advantage, favour, privilege or immunity granted by any contracting party to any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories

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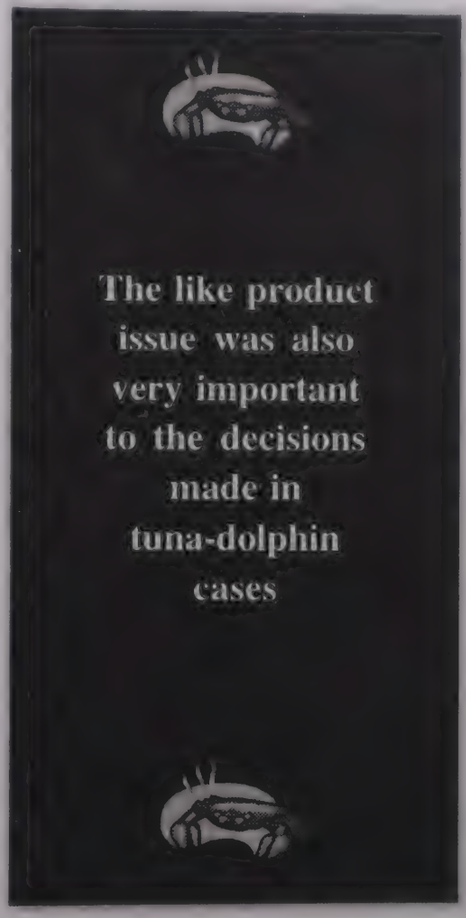
* Article III calls for national treatment on internal taxation and regulation between imported and domestic products so as not to afford protection to domestic production.
* Article XI calls for the "general elimination of quantitative restrictions".
* Article XX entitled 'General exceptions' allows states, subject to certain conditions, to depart form GATT obligations to serve legitimate policy objectives, which includes inter alia measures necessary to protect human animal or plant life or health and the conservation of exhaustible natural resources.

The Tokyo Agreement (t 979) on Technical Barriers to Trade (TBT) did not cover PPMs. However, technical standards and regulations in the Uruguay Round's TBT Agreement do cover 'product characteristics and their related processes and production methods'. But the term is limited to coverage of PPMs that are characterised in the final product.

The trade law does not question the right of countries to discriminate on the basis of product-related PPMs. WTO rules recognise the legitimacy of import restrictions to enforce product requirements related to characteristics of a product or related PPMs that affect the characteristics of the product (product related PPMs). Such PPMs requirements are covered by WTO agreements on TBT and on Sanitary and Phytosanitary (SPS) Measures.

In fact the SPS Agreement also, requires members to ensure that any Sanitary or Phytosanitary Measure is applied only to the extent necessary to protect human, animal or plant life or health. It should also be based on scientific principles and should not be maintained without scientific evidence.

The rule that imported and domestic 'like products' should be treated equally under national trade policy, regardless of how they were produced, is considered by many to be fundamental to the effective functioning of the



trade system. Yet discriminating among products on the basis of how they were produced is at the heart of much domestic environmental regulations. A further problem is the accepted methodology for measuring all environmental impacts during the full life cycle

In 1992, Austria announced a mandatory label for tropical timber and tropical timber products, which was opposed by Association of South East Asian Countries (ASEAN). It was intended that all commercial timber would bear a label displaying the inscription 'made from tropical timber' or 'contains tropical timber'. The ASEAN countries however, argued strongly that the label requirement were inconsistent with the provisions of GATT, as the regulations did not apply to other types of wood, which were 'like products'.

Similarly the 'like product' issue was also very important to the decisions made in tuna-dolphin cases. The US ban on Mexican tuna caught with dolphin killing purse seine nets is a good example of process based trade ban. Key questions, which were attempted in the case, are:

* Can one country tell another what its environmental regulations should be?
* Do trade rules permit action to be taken against the method used to produce goods (rather than the quality of the goods themselves)?

When the dispute came before a GATT panel, the panel ruled that the rules of GATT, which allow national product standards to be imposed on imported goods, did not apply in this case because it was the process by which the tuna was produced, rather than the tuna itself, which was being rejected (See box #1). .

Setting high standards or acting as non-tariff barriers

The multilateral trading system is sometimes criticised because it does not distinguish between products produced in a sustainable manner and those produced in unsustainable manner. For environmentalists, production method is one of the three central questions: How a product is made, how is it used and how is it disposed of. From an environmental viewpoint, controlling the production process becomes an increasingly important element and it makes sense to discriminate at the border between otherwise like goods that were produced in different ways.

In practice, however, enforcement by one country of its own PPM standards and regulations on products imported from another country, is an inappropriate and inequitable way of achieving sustainable development,

particularly if the latter country is an economically weaker partner. Many countries, at times use PPMs standards as trade barriers and deny market access to products from developing countries.

The US shrimp-turtle case is of great significance for internationally traded products, which like shrimp, might be subject to environmental standards. The WTO Appellate Body report in the case represents a significant advance in the WTO's examination of the Interaction between WTO trade rules and domestic trade measures taken on environmental grounds.

The Appellate Body found the US measures unjustifiable and stressed the need for WTO members to seek multilateral solutions to environmental challenges before resorting to unilateral actions (See box #2).

Unilateral trade measures aimed at changing the environmental policies and practices of other countries are in fact, in many cases motivated by the perception that high domestic environmental requirements put domestic industry at a competitive disadvantage in international markets. This is despite the fact that most economic studies suggests that there is no specific link between the level of environmental regulation adopted by a country and its economic performance in terms of competitiveness of its industry. Hence it makes little sense to implement trade measures in form of bans or eco-duties in an attempt to equalise production costs across borders.

One of the propositions made in Agenda 21 of UNCED is "Countries should not use trade measures to offset differences in costs which arise from differences in environmental standards and regulations". In fact as the other proposition says the developed countries should consider the limited capabilities of developing countries to apply standards that exist in developed countries.

Effectiveness of the use of PPM based trade measures, as a tool to achieve environmental objectives can be questioned on many grounds. Some

of the practical difficulties are:

1. Trade protectionism. These practices would give many countries greater opportunity to protect their industries unfairly against foreign competition. Under the pretext of environmental concerns some countries might penalise other countries which do not import certain goods from their domestic industry by enacting new regulations. Many countries would take unilateral actions mainly motivated by economic considerations.
2. There is concern that one or several nations could use their superior commercial power to impose their environmental standards on other nations without their consent or participation in the development of such standards. For instance, compared to what harm the US, as a nation is doing to another global shared resource, the climate and atmosphere, what nations like India, Pakistan or Thailand are doing to the marine turtle is a contemptuously small problem. The important thing to be noted is that of course it is important to save sea turtles, but can the countries like Bangladesh and Maldives, which are likely to be most affected by global warming, impose trade sanction on the US and expect it to be effective?
3. Similar is the argument of value based PPMs, in which PPMs that conflict with strong values or moral preferences are targeted. In these cases frictions are bound to arise when PPM requirements are derived from values that may not be universally accepted. Powerful countries will be able to indulge their "values" but weaker ones are less likely to be able to do so.
4. The technical impracticability of identifying and monitoring the processes used to produce traded products is a major obstacle to the use of PPM based trade restrictions. It is particularly important in non product related PPMs, wherein PPMs do not affect physical characteristics Of a product. It is practically impossible to detect most of the PPMs in the product itself, with the available technologies. This may lead implementing countries to impose restrictions on broader categories of products, then those affected by regulated PPM.
5. i) Developing country enterprises lack the skills and technology required for exploiting the positive trading opportunities generated by environmental measures.
   ii) Also their exports are more vulnerable to market access

Box 1: The Tuna-Dolphin Dispute

This case was handled under the old GATT dispute settlement procedure, however it still attracts a lot of attention because of its implications for environmental disputes. In 1988, a California based environmental group, Earth Island Institute, sued to enforce the congressional mandate under US Mammal Protection Act (MMPA). The group was of the opinion that fishermen in violation of the law were killing the dolphins in the eastern tropical Pacific Ocean, where the tuna swim together with dolphins.

The MMPA, enacted in 1972, required the US government to curtail the incidental killing of marine mammals by commercial fishermen. In addition to imposing limits on US fishermen, the MMPA required the secretary of commerce either to certify that foreign governments were taking steps to prevent the killing of marine mammals or else to prohibit the importation of tuna products form the offending countries.

The federal court in the case agreed that the administration was not upholding the law and ordered Mexican tuna imports banned form the United States. Interestingly, at the time the ban was imposed, the US tuna fleet had largely abandoned fishing in this part of the Pacific Ocean, so the dolphin protection provisions of the MMPA did not apply to them.

Mexico argued that its right to sell tuna in the US had been violated, and asked for a GATT dispute settlement panel to adjudicate the matter. In September 1991, the GATT panel concluded that the US was in violation of its GATT obligations. Specifically the panel found that:

* The US ban violated GATT Article III's national treatment requirement, which preempts trade measures based on production practices.
* The US kill-ratio standard was inappropriate because it was retroactively determined based on the number of dolphins killed by American fishermen in any given year and thus uncertain until after the fact.
* The US ban could not be justified under GATT Article XX(b) for action necessary to protect human or animal life or Article XX(g) for the conservation of exhaustible natural resources and that these exceptions could not be applied unilaterally or extrajurisdictionally.
* The US was justified in using its "dolphin safe" tuna labeling programme because the programme had no discriminatory effects.

However, Mexico decided not to pursue the case further and the panel report was never adopted even though some of the "intermediary" countries pressed for its adoption. Mexico and the United States decided to have bilateral consultations aimed at reaching agreement outside GATT. Hence technically the case has no value as a binding GATT precedent, but it is seen as indicative of GATT decision making priorities and has provoked heated debates over GATT resolution of trade and environmental conflicts.

barriers on account of their scale and sectoral composition. For example India's tea exports have been affected due to pesticide concerns of developed countries. In spite of Indian exporters adhering to maximum pesticide residue standards as per US Environment Protection Agency's (EPA) recommendations, some European countries impose stricter limits.

6. Even if in certain industries, environmental conditions improve because of process standards requirements there are two sets of concern:
   i) The standards thus imposed might be environmentally inappropriate for other countries with different geographic locations. A country where, for instance, water scarcity is a major issue might enact laws discriminating against products produced in ways that consume more water or waste it. This action would force exporters in water-rich countries to follow standards that are not relevant to their local environmental conditions.
   ii) The other concern is based on a related argument from some developing countries that argue that their social priorities differ from those of developed countries. Some of them, for instance, might be more concerned about clean water as an environmental issue than with global warming. Or they may be more concerned about education, health care and infrastructure than about any environmental issue.
7. Some of the developing countries also argue that the developed countries became rich by exploiting natural resources in unsustainable manner in the past. Now since they have become wealthy, they are capable of maintaining high environmental standards and so are talking in the tune. It is sanctimonious to forbid developing countries to follow the path, which they themselves have followed. And in fact if they are really sincere in their efforts, they should provide technical and financial assistance to the developing countries to bring about environmental improvements, before creating any restrictions.
8. On the contrary, some trade experts have raised the point that in the name of clean production processes many developed countries are trying to sell their equipments (to control pollution) or technology which is available with them and for

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Box 2: The Shrimp-Turtle Case

In January 1997, India, Malaysia, Thailand and Pakistan took the United States to the WTO's dispute settlement panel arguing that the US import ban of shrimp and shrimp products pursuant to Section 609 of US Public Law 101-162 was in violation of WTO obligations. The US, in 1996, had imposed unilateral ban on shrimp and shrimp products from countries which did not meet the required criteria under its national law.

The US Congress passed section 609 in 1989 to prohibit the import of shrimp from countries, which were harvested in a way harmful to sea turtles. According to this law the US State Department was asked to certify nations that had a sea turtle protection programme comparable to that of the US. The certification process also demanded that turtle kills of exporting countries not exceed the turtle kills of the US fisherfolk, and recommended that fisherfolk use turtle excluder devices TEDs) to minimize turtle kills.

The object of the US legislation was two-fold. First as declared by its sponsors, the legislation attempted to "level the playing field" between US shrimps who were subject to the costs of complying with US environmental regulations and foreign shrimpers who were not. Second, for environmentalists the legislation pressures foreign governments to change their domestic regulations to protect endangered sea turtles from commercial shrimping practices if they wish to sell shrimp products in the US market.

The rulings of the WTO's dispute settlement panel in case were against the US but later on their intensity was diluted. In April 1998, the panel held that the US import ban on shrimp and shrimp products "were clearly a threat to the multilateral trading system" and consequently were "not within the scope of measures permitted under the chapter of Article XX". On October 12, 1998 the WTO Appellate Body overruled the initial panel in its reasoning, but not in its result.

The Appellate body found seven flaws in the US's application of

Section 609:

1.The US requirement that all exporting members adopt essentially the same policy as that applied in the US had an unjustifiable "coercive effect" on policy decisions made by foreign governments.

2. The US did not assure that its policies were appropriate for the specific local and regional "conditions prevailing" in other countries.

3. Even where shrimps were caught using US-prescribed methods, the US still prohibited their importation if they were caught in countries not requiring the use of TEDs.

4. The US did not seriously attempt to reach a multilateral solution.

5.The US discriminated among WTO members by applying different "phase-in" periods during which they must require shrimp trawlers to use TEDs.

6. The US made far greater efforts to transfer the required TED technology to countries in the Caribbean/ western Atlantic region "than to other exporting countries, including the appellants".

7. The application of the US measure was "arbitrary" in that the certification process is not "transparent" or "predictable", and does not provide any "formal opportunity for an applicant country to be heard or to respond to any arguments that may be made against it."

Judicially the Appellate body did not criticize the US Congress but rather the US implementing agency, the Department of State, which drafted the applicable guidelines. The body held that the US ban was discriminatory only in the manner in which it had been imposed, and reversed the dispute panel's ruling that the action was not justified under article XX of the General Agreement on Tariffs and Trade (GATT).

The important implication of this case was however unexpressed in the Appellate body's report. The body in a way accepted that shrimps could be differentiated on the basis of the process in which they are caught. This differentiation between 'caught in aquaculture', 'caught in wild' and 'caught in boats equipped with TEDs' opened the doors to new trade disputes based on processes or production methods.

which the domestic markets are saturated. They are trying to create new markets in developing countries for these technologies by means of trade restrictions

9. There are some concern about PPM-based criteria in the context of voluntary mechanisms such as international standards for environmental management systems (EMS) and eco-labeling. Cost and lack of awareness generally hobble small companies from developing countries, and they find it very difficult to install an EMS and obtain certification. Some developed countries are also enacting laws and regulations on packaging, recycled content provisions, and deposit refund provisions. For example if an empty beer bottle cannot be recycled then the product must be sent back. These policies are clearly advantageous to local producers.

10. Many developing countries worry that if special criteria are developed to allow discrimination on the basis of PPMs, it could be viewed as a precedent that would result in call for the WTO to also establish similar criteria for Social programmes, labour standards, human rights etc:, all of which might be said to be consistent with the concept of sustainable development.

11. Then there is the sovereignty argu-

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ment. If the environmental externalities are limited to the exporting countries, with their effect not being transferred to the importing country via the product, then it is really in the purview of the exporting, not the importing country. However, this argument weakens if the environmental damage in question has transboundary effects.

We all support that environmental degradation should be avoided at all stages in the life cycle of a product. For this purpose environmentally based PPM measures can become helpful provided they are used as a means to set high standards and are supplemented with financial and technical assistance to developing countries. However using PPM measures, as trade barriers would never be an effective or appropriate move in dealing with environmental problems.

Moreover, in most of the cases, PPM based restrictions are intended to control environmental effects caused during production. The importing country will in no way be affected by PPMs used in exporting country as long as there are no transboundary pollution effects. It makes little sense for importing countries to implement process standards, as it would not help in protecting domestic environment.

While dealing with intrinsically domestic environmental problems each country should be allowed to set standards according to its own priorities and, environmental and developmental conditions. It is unfair for developed countries to discriminate against developing countries' exports based on environmental issues that are not high on their agendas, forcing them to either adopt rich country environmental priorities or suffer a loss of lucrative exports. Also as mentioned in Agenda 21, developed countries should consider the limited capabilities of developing countries to apply standards that exist in developed countries. In fact transfer of environmentally sound technologies should be encouraged to developing countries in order to build capacities.

Even if in certain multilateral environmental agreements where global environmental objectives are being promoted, and where there are transboundary or global environmental impacts, PPM related measures in practice may not be feasible to implement. In the Montreal Protocol, for instance, it has not been considered practical to include products that are made with but do not contain CFCs.

The ruling in the shrimp-turtle dispute also raises difficult questions concerning the application of trade rules to product and process related standards. The Appellate Body appeared to suggest that it was not the extraterritorial application of US environmental standards that violated WTO rules in this case, but the arbitrary manner in which the US law was applied.

Some environmentalists are of the view that it is entirely appropriate to extend WTO rules beyond product characteristics and into production processes. But then many issues will be raised including those of labour standards, human rights and social programs. Hence trade restrictions are not going to help to solve the problem. Emphasis is to be given on building institutional capacity to integrate trade and environment policies within the framework of national policies for sustainable development. Rio Declaration and Agenda 21 can guide the international cooperation aiming at accelerating development, improving market access and open trading system.

Recommendations

- PPM based measures should be used to set higher standards and Should not be allowed to act as trade barriers.
- International cooperation for Striking a balance between environmental and trade concerns should be encouraged as per the statements made in Rio declaration and Agenda 21.
- Financial and technical assistance should be provided to developing countries, and transfer of environmentally sound technology should be ensured.
- Developed,countries should not give undue protection to domestic industry and should encourage import of environmentally friendly products from developing countries by giving special incentives.
- Rich countries should pay for consuming the environmental space, reduce their over consumption and encourage, without compulsion evolution of higher environmental standards in developing countries.

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INFOFISH in association with the Marine Products Export Development Authority (MPEDA) and Seafood Exporter's Association of India (SEAI) is organising Fourth World COnference on the Shrimp Industry and Trade - Shrimp 2001, at Chennai from 27-29 September 2001. This will be a global forum for all those connected with Shrimp industry and trade to assemble and exchange ideas of mutual interest. Apart from Indian delegates, we expect pover 250 overseas delegates in this event.

World shrimp production continues to grow steadily, after successfully overcoming a spate of problems ranging frome conomic crises to viral disease outbreaks. In fact, buoyed by improving market prices, some believe the worst is over and better times are ahead. The time has come to take stock of the industry once again. The last time an INFOFISH conference looked at the shrimp industry was at the AQUATECH conference held in Kuala Lumpur, Malaysia in 1996.

During Shrimp 2001, which will be held in Chennai located on the east coast of India at the centre of its booming shrimp culture industry, an international panel of experts, industry leaders and policy makers will review the critical issues involved in the growth and expansion of the industry. Here is a unique opportunity to gain new insignts to the industry, make and renew contacts, exchange ideas and negotiate business deals. INFOFISH conferences are well known worldwide as the ideal opportunity for buys, sellers, investors, exports and policy makers to come together to exchange ideas and conduct business.

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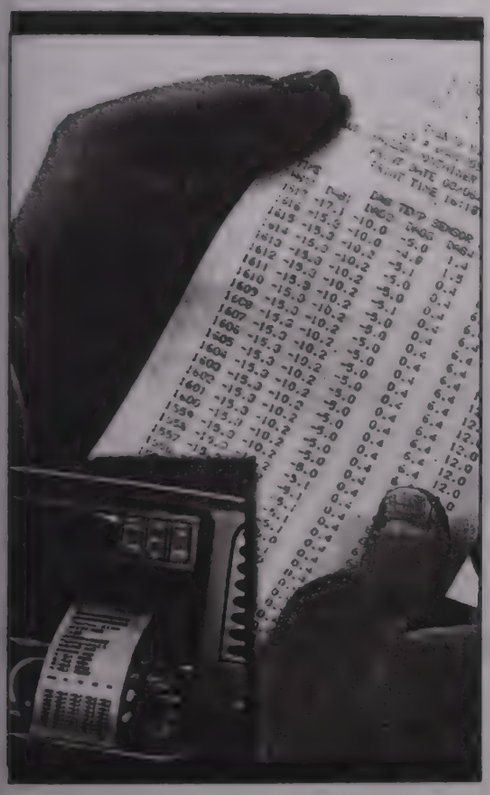

Electronic temperature monitors, the latest technology in reefer. trucks, safeguard seafood in transit

Michael Crowley

Today's emphasis on food safety, along with stricter regulations for food suppliers, has forced manufacturers of intransit refrigeration units to become more than just purveyors of coldair-generating equipment.

Some now equip distributors of perishables like seafood with tools for documenting the conditions under which products are transported. Such monitoring devices protect both the supplier and its customers.

"It's no longer a business of just making refrigeration devices. It's also managing people's data and business, and ensuring that the product load is being hauled at the right temperature," says Steve Stucky, global marketing director for truck products at Thermo King in Minneapolis.

There are a number of ways to obtain and access information that tells what's happening to seafood inside a refrigerated truck. The two major players in truck and trailer refrigeration, Thermo King and Carrier Transicold, based in Syracuse, N.Y., install sensors in their truck or trailer bodies that are tied to a microprocessor.

"These provide validation of the air temperature at any one time," says Stucky. The sensors continue to monitor conditions even when the refrigeration unit is shut down.

Several monitoring options are available, depending on user requirements. It's possible to track the conditions at different positions in a truck anywhere on the route, or to wait until the end of the trip to either get a direct printout or download data.

When an order is dropped off, the customer can also be given a printed record or data to download.

Both Carrier Transicold and Thermo King offer remote monitoring of refrigeration systems via satellite.

Carrier Transicold's system, called DataTrak is for use only in trailers. It uploads data from the Carrier microprocessor to a satellite; the data is then downloaded to the trucking company's transceiver.

DataTrak provides temperature information and alarm codes from the truck. Once data is received, the trucking company can contact the driver if corrective action is needed.

Thermo King lets users transmit data to a satellite from either a truck or trailer via two devices, a data-management system and a data-acquisition system.

Thermo King's DAS (data-acquisition system) records the temperature inside the trailer as frequently as the operator desires, be it every 30 seconds or every hour.

And because the DAS is tied into the microprocessor that controls the refrigeration unit, it also notes when the unit goes from heat to cool mode or is defrosting and records maintenance alarm codes, such as low-coolant levels.

This data goes from a satellite to a Web site, where the customer can retrieve the information using Thermo King's Wintrac software or a handheld printer.

For non-satellite retrieval of information, Carrier Transicold offers its DataLink system for trucks and trailers. Data from this system can be downloaded to a laptop or captured through a software program called Advanced Micro, whereby you slide a computer card into the unit and download the information onto the card, which is later plugged into a computer.

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If your customers have the proper software, they can obtain whatever information they need once it's been downloaded.

Thermo King's Data Management System is a similar program. Though it can't download with a card, a trip's refrigeration history can be obtained in either table or graphic form with a PC or a handheld printer.

In addition, Thermo King has what it calls AccuTrac. This device fits into the radio slot in a truck cab. The unit stores onboard information and serves also as a thermal printer.

When a customer wants to know the temperature of the truck body in which his order was carried, the driver can immediately provide a printout showing the temperature history on 2-inch-wide paper. The refrigeration history for the entire trip also can be printed out when the truck is back in the garage.

While it's valuable to have an instant record of the conditions in a refrigeration unit, ongoing data collection makes it possible to spot inefficient trends that need to be corrected to lower operating costs and ensure product quality.

"The whole thing [data acquisition] is about customer ease of use and having data on demand," says Scott Pallotta, Carrier Transicold's truck product manager.

Industry resistance

The high-tech products from Carrier and Thermo King are recent introductions, but temperature tracking technology on one level or another has been available to U.S. distributors for nearly a decade.

While large distributors like Sysco have taken advantage of it, the U.S. seafood industry has been slow to embrace the technology, says Stucky.

In Europe, the seafood industry has been using data-gathering equipment for the past 10 years.

"Data loggers are part of the [refrigeration] product if you're hauling frozen [seafood] in northern Europe," says Stucky.

"For fresh, it isn't part of the regulation, but most customers use it because the end user requires it." He thinks the same thing will eventually happen in the domestic seafood business, "given that HACCP [hazard analysis critical control point] is part of the seafood business now, as well as chicken and beef.

"For HACCP you have to prove that you are hauling at a temperature that's been specified."

But for now, what appears to prevent a lot of smaller seafood companies from purchasing the new monitoring equipment is cost. Though the prices aren't outlandish — from $700 to $1,500, depending on the dealer and the desired options — many say they just don't want to part with the extra cash on top of the investment in a refrigerated truck.

"Seafood guys are trying to save every penny they can. Tell them how much it is, and they'll hold off buying it," says John Chartier, owner of Mass. Truck Refrigeration Service in Auburn, Mass.

He remembers in the 1960s, when meat haulers would freeze a 55-gallon barrel of water at night and then put it in the truck during the day; that was the extent of their refrigeration. And five or six years ago, he says, many egg haulers didn't have refrigeration. Then the government stepped in, forcing both industries to refrigerate their products properly while in transit.

"Eventually it will happen with seafood. They'll have to bite the bullet," says Chartier.

And that means investing in equipment that will keep seafood safe by monitoring what happens inside the truck or trailer body.

Courtesy: Seafood Business

Study finds fish fatty acids may prevent Alzheimer's disease

Link between seafood and neurological health strengthened

Eating fish may help prevent Alzheimer's disease and dementia, according to a new study by a University of Guelph professor reported in journal Lipids.

The study, which strengthens the link between seafood consumption and neurological health, is good news for the elderly and the seafood industry.

"Our research suggests that (increasing) fish, fish products or other sources of omega-3 fatty acids in the diet of both the population at large and the elderly seems prudent," says Julie Conquer, director of Guelph's Human Nutraceutical Research Unit, who led the research team.

Researchers studied blood samples from 70 Toronto-area residents. They found that elderly people with normal cognitive functioning had higher levels of DHA (docosahexaenoic acid) than a second group of elderly people who suffer Alzheimer's, dementia or other cognitive afflictions.

DHA is a type of omega 3 fatty acid found in oily fish like tuna, salmon and mackerel..

"Given that our research indicates that decreased levels of DHA also appear to accompany cognitive impairment with aging", says Conquer, we think this is a sign we should all be eating more fish."

The greatest challenge will be increasing fish consumption among elderly people who live alone, says Conquer.

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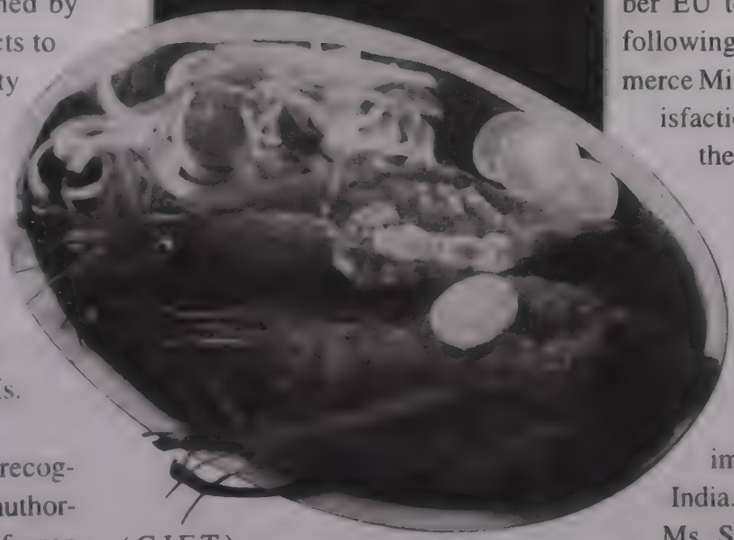
Green light sought for seafood cargoes. Govt. in parleys with US, Australia

The Government of India is in the process of finalising agreements with the United States' Food and Drug Administration (USFDA) and the Australian Quarantine and Inspection Service (AQIS) to ensure that marine product consignments from India cleared through the Export Inspection Council of India (EICI) are not subjected to routine and 100 percent inspections by the concerned authorities in those countries.

"We have gained sufficient experience over the last three years in establishing standards to be maintained by exporters of fish and fish products to the European Union in conformity with the requirements of EU Directive 91/493/EEC. Based on this experience, we are now working out similar agreements with the USFDA and AQIS so that consignments approved by us do not have to be inspected again there," the EIC Director, Ms. Shashi Sareen said.

We have gained sufficient experience over the last three years in establishing standards to be maintained by exporters of fish and fish products to the European Union



She said the EU had already recognised the EIC as the competent authority for granting approval to fresh, frozen and processed fish and fishery products in India, which meet the requirements of the EU Directive 91/493/EEC. Only units approved by the EIC would be permitted to export to EU countries.

According to Ms. Sareen, as on date, 95 processing units and eight freezer vessels have been approved for processing fish and fish products for export to EU countries. Assessment of units was an ongoing process involving two-stage clearance at the level of an Inter Departmental Panel (IDP) and Supervisory Audit Team (SAT), comprising experts drawn from the Central Institute of Fisheries Technology (GIFT) and the Marine Products Export Development Authority (MPEDA).

Only the units recommended by SAT are approved by the EIC. The units, which qualify for approval, are added to the list of approved establishments and the list is forwarded to the EU on a periodic basis.

"As the EU is satisfied by the capability of the EIC, the updated lists' of approved establishments furnished to it are accepted," Ms Sareen added.

The European Commission had on August 1, 1997 prohibited imports of Indian fish and fishery products based on the findings of a team of experts of EU that had visited the country in June 1997. The team had reported the prevalence of substandard sanitary and hygienic conditions in some of the processing establishments here.

Subsequently, the EIC came up with additional norms regarding hygiene standards in line with the EU's requirements and directed all seafood processing units to upgrade their facilities and seek fresh assessment and approval from the EIC.

During November 1997, a two-member EU team again visited India and following meetings with senior Commerce Ministry officials expressed satisfaction about the role of the EIC as the competent authority in approving and monitoring seafood exporting establishments as stipulated under 91/493/EEC Directive. Based on the assessment made by the team, the EU on December 23, 1997 lifted the ban on imports of fishery products from India.

Ms. Sareen noted that the perception of quality with regard to seafood has changed in recent times from food standard to food safety. This had come partly on account of the general increase food poisoning cases across the globe caused by micro-organisms that gain entry into the product at different stages of handling,

"Apart from seafood, the Commerce Ministry has from December 16, 2000 also entrusted the EICI the responsibility of monitoring all dairy exports and processing plants. This is to enable a single window quality control over dairy exports from the country," she added.

Source: Hindu Business Line

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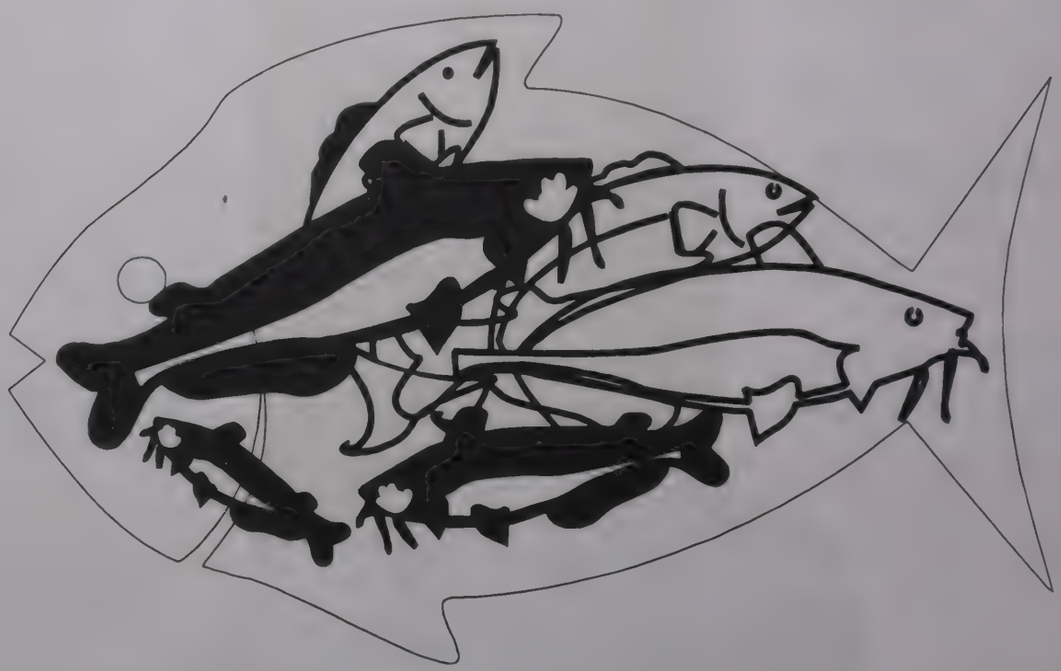

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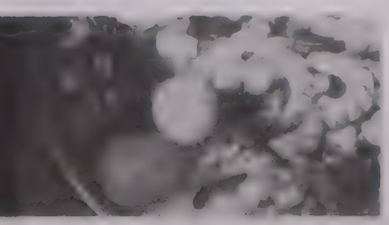
Shrimp Fever

Shrimp farming explodes in Vietnam. But at what cost?



Farmers jumping on the lucrative shrimp-raising bandwagon threaten to destabilize the Mekong Delta agricultural heartland, officials there say.

An explosion of unplanned shrimp farming concerns provincial authorities in Bac Lieu and Kien Giang.

Shrimp farming can return quick profits dozens of times higher than the farming of rice or other crops.

The government, after some consideration and lobbying by farmers, consented to allow a number of Mekong Delta farmers to replace their rice paddies with shrimp ponds.

"The restructuring of plant cultivation and livestock raising in rural areas is a policy initiated by the government to improve the living standards of rural people," said an official from the region.

"However," the official added, "the process has gone too fast, resulting in the rampant development of unplanned shrimp-raising in the delta provinces and beyond the locality's development plan."

Huynh Viet Khai, director of the Ca Mau Department of Fisheries, said the area for shrimp raising in Ca Mau province now spanned 180,000 hectares (444,600 acres), an increase of more than 100,000 hectares (247,000 acres) over last year.

U.S. shrimp imports from Vietnam have risen from $5.1 million in 1994 to $235.6 million in 2000, according to the National Marine Fisheries Service. Imports grew from $109.1 million to $235.6 million between 1999 and 2000 alone.

This largely "spontaneous" expansion was triple what was allowed for in the annual plan, which projected that 33,000 hectares of permanent rice fields would go into rotations between rice paddies and shrimp ponds, Khai said.

The development had led to a host of problems for farmers, the environment and officials, he said.

People had, for example, damaged dikes to flood their shrimp ponds with salt water. "Dikes for most of the 200,000 hectares of acid-free fields have been damaged, and efforts to develop plants and livestock for the area as planned have been neutralized," Khai said.

An official from the Ca Mau Department of Agriculture and Rural Development added that intruding seawater was threatening rice and sugarcane crops and fruit trees.

Khai said too many farmers were going into shrimp raising half-cocked and many had neither the experience nor the expertise to raise shrimp successfully.

The obvious outcome would be shrimp dying in large quantities, major environmental damage, and farmers watching their entire savings disappear, he said.

Khai said shrimp farmers in Ca Mau needed 12 billion breeder shrimp for each crop yet the province could supply only two-thirds that number. Prices for breeder shrimp had skyrocketed accordingly.

http://www.gofish.com/cgi-bin/WebObjects/Gofish.woa/wa. In addition, he said, the coming harvest promised to be plentiful, yet processing facilities were insufficient and farmers were likely to sell their shrimp en masse, sending prices falling.

The same situation had arisen in the Mekong Delta provinces of Bac Lieu and Kien Giang. These provinces asked the government to send an intersectoral working group to design an agricultural restructuring plan for their region. But the government replied by asking the provincial authorities to tackle the job themselves.

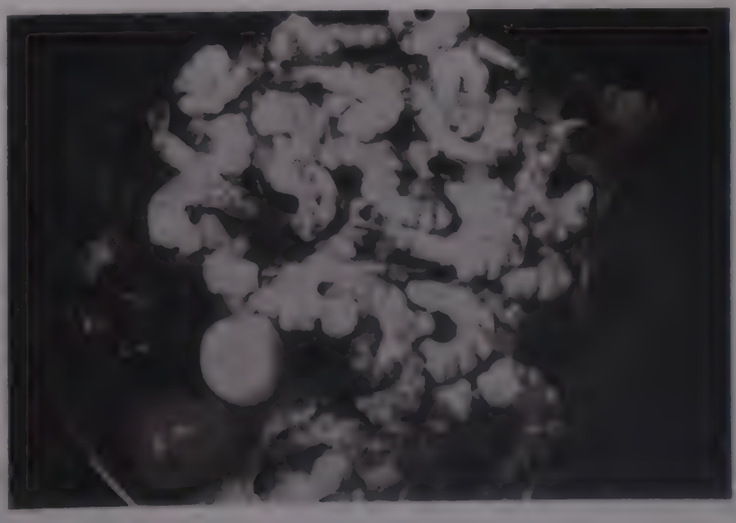
The Vietnam Investment Review.

U.S. shrimp imports from Vietnam

Year	Value*
1994	$5.1
1995	$16.6
1996	$28.2
1997	$46.2
1998	$75.9
1999	$109.1
2000	$235.6

*(in millions)

Source: NMFS



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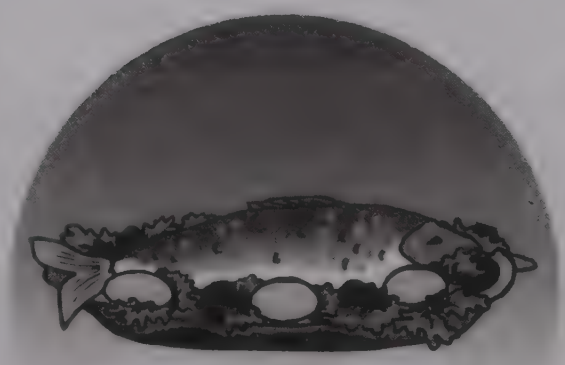
A New Kind of Fish Story: The Coming of Biotech Animals

By Carol Lewis

Potatoes with built-in insecticide. Rice with extra vitamin A. Decaf coffee beans fresh off the tree. Just when Americans have begun to digest the idea of custom-built crops, along comes another major advance in biotechnology that could make an even bigger splash onto the dinner plate: genetically engineered fish.



Using the same type of gene transfer techniques that give plants new, more desirable traits, scientists have created a genetically engineered variety of Atlantic salmon that grows to market weight in about 18 months, compared to the 24 to 30 months that it normally takes for a fish to reach that size. For fish farmers, raising these so-called transgenic fish could be faster and cheaper because it takes less feed and about half the time to produce a crop they can send to market.

Transgenic animals are just another class of products developed through biotechnology that, it is hoped, will give renewed energy to the decades-old Green Revolution. Transgenic technology promises more and better crops and food animals to feed a continuously growing world population. Genetically engineered plant crops, such as corn and soybeans, have been on the market for several years. Now, genetically engineered animals may soon begin to make their way through the regulatory net, and ultimately to the dinner table—possibly starting with fast-growing fish that the sponsor promises will begin a "Blue Revolution."

The potential benefits of transgenic animals, however, do not stop at food production. Scientists created the first transgenic animals to advance basic biomedical research, genetically modifying lab rats, mice, rabbits, and monkeys to give them characteristics that mimic human diseases. These research resources, for example, rapidly advanced the understanding of oncogenes—genes that have gone awry and are responsible for causing cancers. Moreover, researchers now seek ways to genetically modify the organs of animals, such as pigs, for possible transplantation into humans.

And finally, transgenics can turn animals, such as cows, sheep and goats, into pharmaceutical factories that produce in their milk protein-based drugs such as alpha antitrypsin, a protein that can be used to treat cystic fibrosis.

Despite these benefits, genetic engineering of animals has met with some of the same resistance already aimed at designer crops. Critics cite ecological concerns, ethical objections and food-safety issues.

But no matter how transgenics is applied, the Food and Drug Administration will play a key role in regulating the products resulting from this rapidly emerging genetic technology. This means that any drug or biologic created through transgenic techniques will need to undergo the same FDA scrutiny as any other treatment that a company wants to market, including clinical trials that demonstrate safety and effectiveness. And while it's still too soon to tell how quickly foods derived from transgenic animals will move to the market, FDA has already begun to focus on how it will ensure that they meet the same safety standards as traditional foods.

Making a Transgenic Animal

Making a transgenic animal is deceptively simple, especially when compared to traditional breeding approaches. In traditional breeding, when farmers or breeders want to introduce some new characteristic into a type of animal, they must find an individual animal that carries the desired trait. They then mate the individual to try to create a new line of animals sharing the genes that express the desired quality.

With genetic engineering, scientists possess the tools to isolate and manipulate single genes in the laboratory. In recent years, researchers have learned to insert single genes into the fertilized eggs of animals in such a way that the new gene is turned on in the resulting adult. (See "Creating A New Variety Of Fish".)

First the scientist isolates the gene that conveys a particular trait of interest-disease resistance or faster growth, for example. Then a molecular vehicle is created that will carry the gene into the nucleus of the cell and permanently integrate it into the chromosome. The

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entire construct—the transplanted gene, called a transgene, and its transport vehicle—might be physically injected into a fertilized egg using a glass needle viewed under a microscope. Other approaches use disabled viruses to inject the construct into the cell. If the egg survives and begins to grow and divide, then the potential embryo is implanted into a surrogate mother. Of the offspring that make it to birth, only a very small number will carry the new gene integrated in such a way that it actually functions.

But when it works, the result is a new individual of a variety of animal with a characteristic never before seen. The individual animal can then be multiplied by conventional breeding. The resulting animal may be enormously valuable. Inserting a single gene into an animal, that then manufactures a rare protein in its milk, could produce a drug that is worth many millions of dollars an ounce. The Genzyme Transgenics Corporation of Cambridge, Mass., for example, has created a goat that carries the gene for antithrombin III, a blood protein that can prevent blood clotting in people. The company purifies the protein out of the goat's milk.

But even though the medical applications of transgenics remain intriguing, the animal health and food production applications seem to be generating most of the new excitement and considerable concern.

Foods Derived from Transgenic Animals

Taking their lead from the scientists who created new genetically engineered crops that, for example, resist insects without the need for pesticide spraying, researchers involved in the production of food animals began to think about how they could use genetic modifications to improve the production or quality of their products.

Typically, says John Matheson, a senior review scientist in FDA's Center for Veterinary Medicine (CVM), "Researchers start with the protein they want to add and work backwards." It's the protein that the transplanted gene encodes that actually gives the animal a new trait.

The best example so far of the transgenic strategy in food animals, and its success, is the faster-growing salmon. The science behind the so-called supersalmon was discovered by accident 20 years ago when Choy Hew, PhD, then a researcher at Memorial University of Newfoundland in Canada, accidentally froze a tank filled with a particular species of flounder. When the tank was thawed out, the flounder were still alive. Initially, no one knew how they survived. This species, it turns out, has a gene that produces a protein that works like the antifreeze in a car's radiator. This antifreeze protein is found in many types of polar fish that must survive extremely cold conditions.

Researchers isolated and copied the part of the flounder DNA that works like a genetic switch to turn on the production of the antifreeze protein. Normally, this genetic switch is only turned on when the fish is exposed to cold.

Hew and his colleagues then attached the flounder's genetic on-switch to a previously isolated gene from Chinook salmon that produces a growth-stimulating hormone. Using transgenic techniques, they inserted the new combination—the flounder on-switch with the salmon growth hormone gene—into fertilized salmon eggs. In the resulting salmon, the flounder's genetic switch appears to stay turned on, producing a continuous supply of salmon growth hormone that then accelerates the fish's development. While the resulting fish do not seem to reach a mature size that is larger than conventional salmon, they grow much faster.

Breeding transgenic varieties is an effective way to create an animal with a new characteristic, but large mammals-cows, pigs and goats-don't multiply as plentifully or as rapidly as fish. Several research teams have turned to cloning—as in Dolly, the sheep—as a way to expand the herd of transgenic animals. This approach combines two cutting-edge techniques. First, a transgenic animal with the desired characteristics is created. Then, cloning techniques are used to create replicas of the transgenic animal. Using a transgenic approach just makes it easier to get the desired genetic characteristics in the animal, which is then cloned to produce a core breeding herd.

Transgenic Critics

Useful as it may be, animal biotechnology won't go forward without objections. For all the promise that industry sees in the dawning era of genetically engineered animals, others-including animal rights activists, environmentalists, and consumers-see problems.

The concern about genetically engineered foods, says Carol Tucker Foreman, director of the Food Policy Institute at the Consumer Federation of

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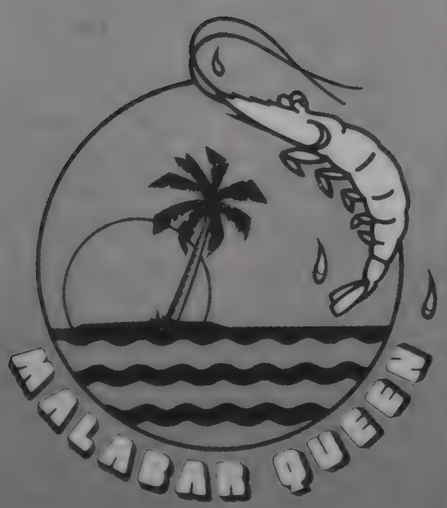

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America (CFA) in Washington, D.C., "is in marked contrast to the public acceptance of genetically engineered drugs. When faced with serious illness, most people are willing to take risks to combat a disease." Food is different, she says, since it is so basic, both physically and emotionally. "It's not surprising that consumers are extremely averse to any food-related risk, especially if the risk is perceived as imposed by someone else, beyond individual control and without any countervailing benefit." Consumers, she says, are concerned mostly about such potential health problems as allergic reactions and antibiotic resistance.

But FDA Commissioner Jane E. Henney, MD, points out that foods produced using bioengineering processes are evaluated to make sure they are not more likely to cause allergies. "Under the law and FDA's biotech food policy," she says, "companies must tell consumers on the food label when a product includes a gene from one of the common allergy-causing foods, unless it can show that the protein produced by the added gene does not make the food cause allergies."

But Art Jaeger believes, "It's not just about dangerous foods—it's also a matter of consumer choice." The assistant director for CFA and advocate for mandatory labeling says consumers need to know when a food is genetically altered because many have religious or cultural convictions that would preclude them from selecting foods produced through transgenic technology. Jaeger says that his organization wants tougher regulations and feels that all information on the safety of biotechnology applications should be made publicly available.

And then there are environmental concerns. Purdue University animal scientist Bill Muir and biologist Rick Howard conducted a study funded by USDA on genetically engineered fish, which led them to warn of possible risks from transgenic fish escaping into nature. They worry that transgenic fish escaping from aquaculture facilities into the wild, for example, could damage native populations, even to the point of extinction. But Elliot Entis, president of A/F Protein, Inc., an international biotechnology firm based in Waltham, Mass., feels that environmental concerns can be addressed by producing transgenic fish in closed aquaculture systems (controlled, artificial environments) or by producing all female, sterile fish.

FDA, in cooperation with other federal agencies, will evaluate these proposed environmental safety measures prior to any approval.

Ethically Speaking

At a time when genetically engineered plant crops have spurred protests in the United States, the use of

Creating A New Variety of Fish: The Technique to Make Transgenic Animals

Breeders can now use the tools of biotechnology to introduce new characteristics into animals. For example, researchers have figured out how to give a type of salmon a gene that directs the production of a growth hormone, causing the fish to grow to full size in substantially less time. Here is an outline of the steps needed to introduce the new growth hormone gene into the salmon.

1. Scientists duplicate the DNA carrying the genetic information for the growth hormone.
2. The gene is inserted into a circular piece of DNA called a plasmid that can be reproduced inside bacteria.
3. Next, the plasmids go inside the bacteria.
4. When the bacteria grow in the laboratory, they produce billions of copies of the plasmid carrying the growth hormone gene.
5. After the copies of the plasmid carrying the growth hormone gene have been produced, they are isolated from the bacteria. The plasmid is then genetically edited, changing its circular structure into a linear bit of DNA. The linear DNA is sometimes called a gene cassette because it contains several sets of genetic material in addition to the growth hormone gene.
6. The gene cassette is either directly injected or mixed with fertilized fish eggs in such a way that the eggs absorb the DNA, making the cassette a permanent part of the fish's genetic makeup. Since scientists insert the growth hormone gene into the fish's egg, the gene will be present in every cell in the fish's body.
7. The eggs are allowed to hatch, producing a school of fish in which some are genetically changed and others are not.

Fish that now carry the growth hormone gene are identified. Fish with the properly integrated gene are used to create a breeding stock of the new, faster-growing variety.

biotechnology in food-animal production is likely to attract an even larger set of critics because both transgenics and cloning deal with animals.

People for the Ethical Treatment of Animals (PETA), a large animal rights organization headquartered in Norfolk, Va., for example, feels that people shouldn't be tinkering with animals like Frankenstein and is very much opposed to intensive animal agriculture.

In general, CVM's Matheson says that for animal safety, the goal of regulating products of animal biotechnology is to ensure healthful surroundings, proper medical treatment, discovery of any special management measures needed, and freedom from pain and suffering.

Regulating Transgenic Animals

FDA already has the legal authority to regulate most products derived from transgenic animals, whether they are used as drugs, as human food, or as animal feed. Therefore, only guidances or regulations that cover specific aspects of animal biotechnology may need to be added-not whole new statutory frameworks for regulating the products. These guidances will likely address such issues as safety of the target animal and protection of the environment.

Most of the gene-based modifications of animals for food production fall under CVM regulation as new animal drugs. The genetically modified growth hormone for the fish, for example, will be regulated the same way the agency regulates bovine somatotropin, the genetically engineered bovine growth hormone that makes cows produce more milk. Transgenics simply provides another means to add growth hormone to an animal.

"When I speak to folks about the regulation of animal genetic engineering," says Matheson, "the first reaction is often surprise that genetically engineered animals could possibly be viewed as containing new animal drugs." People are surprised, he says, because their experience with animal drugs is limited to products they buy

for their pets.

With transgenic salmon, the inserted growth hormone trait is inherited by subsequent generations. With cows, the drug is periodically injected into each one. Either way, products regulated as new animal drugs in the United States are subject to rigorous premarket requirements to determine effectiveness and ensure food, animal and environmental safety.

"One of the good things about regulating transgenics as animal drugs," says CVM director Stephen F. Sundlof, DVM, PhD, "is that we can make sure that the environmental controls and other safety measures are built right into the process." This process includes target animal safety, safety to the environment, and safety for consumers to eat foods derived from genetically engineered animals.

CVM intends to use various approaches, including a contract with the National Academy of Sciences, to identify further environmental safety issues associated with investigation and commercial use of transgenic animals. To do this, the agency will cooperate closely with other federal and state agencies that have related authorities, such as the Fish and Wildlife Service and the National Marine Fisheries Service, in the case of transgenic Atlantic salmon.

Looking to the Future

The agency already is gearing up for the major debates it expects regarding transgenic animals—debates likely to mirror the discussions now underway for bioengineered crops. At this time, no transgenic animals have been approved to enter the human food supply, but a few individual transgenic animals have been allowed to be rendered and used in animal feed.

While it's true that new compounds to combat specific diseases or to optimize the nutritional value of food products can also be created by conventional means, researchers believe that transgenics technology can help make it possible to produce them more quickly, in larger quantities, and ultimately, at lower cost to consumers.

"After over 10 years of examining products on a case-by-case basis," says Matheson, "I can say that the guidance and regulatory structure for animal biotechnology is starting to evolve. I hope we can learn from our experiences with plant biotechnology to make the road a little smoother."

Carol Lewis is a staff writer for FDA Consumer.

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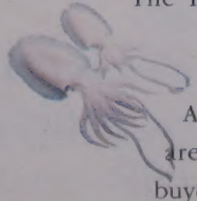

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